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REMARKS

The Examiner issued a final rejection on July 2, 2003. On September 2, 2003, applicants filed an amendment after final with a properly executed Certificate of Mailing. (See the front page of the amendment after final.) On December 12, 2003, the Examiner mailed an Advisory Action wherein the Examiner indicated that the amendment filed on September 2, 2003 would not be entered. In the Advisory Action, the Examiner indicated that the period for reply expired three months from the mailing date of the final rejection.

Applicants respectfully note that when an amendment after final is filed within two months of the mailing date of a final rejection, the period for reply expires on (1) the mailing date of the Advisory Action, or (2) the date set forth on the final rejection, whichever is later. (See MPEP §706.07(f).) In the present case, the amendment after final was filed on September 2, 2003 with a properly executed Certificate of Mailing. Thus, the amendment after final was filed within two months of the mailing date of the final rejection. As a result, the period for reply expired on the mailing date of the Advisory Action, namely December 12, 2003.

Applicants also filed 11 sheets of formal drawings on July 30, 2002, which were received by the USPTO on August 5, 2002. (Please see attached copy of return receipt postcard.) From what applicants can determine, the Examiner has not indicated whether the drawings have been entered into the application. In the next communication following receipt of the drawings, the applicants are to be notified by the Examiner if the drawings have been entered and, if not entered, applicants should receive an explanation as to why the drawings were not entered. (See MPEP §608.02(h).)

The present amendment is in response to the final rejection mailed on July 2, 2003, and is substantially the same as the amendment after final that was filed on

September 2, 2003. Claims 2-6, 8-10, 26, 33-36, and 45-55 are in this application. Claims 1, 7, 11-25, 27-32, and 37-44 have been previously cancelled. Claim 50 has been amended to correct an inadvertent error. Claims 2-5 and 8-10 have been allowed.

The Examiner rejected claims 26, 33-36, and 45-55 under 35 U.S.C. §112, first paragraph. With respect to claim 26, the Examiner argued that the specification does not disclose a first dielectric material that lies in a first region that lies horizontally entirely between the second and third metal lines. The Examiner also argued that the specification does not disclose a second dielectric material that is formed over the first region.

With reference to applicant's FIGs. 5B and 12B, the first plurality of metal lines of claim 26, including the first, second, and third metal lines, can be read to be, for example, the left metal line, the center metal line, and the right metal line of metal-1 layer 316. In addition, the first dielectric material of claim 26 can be read to be, for example, the dielectric material that contacts the side walls of the center metal line of metal-1 layer 316.

With respect to the first region of claim 26, applicant notes that a volume exists horizontally entirely between the center and right metal lines of metal-1 layer 316. The volume, in turn, can be defined to include a left region that contacts the side wall of the center metal line and an adjoining right region that contacts the side wall of the right metal line. Thus, a left region and a right region can be defined to lie horizontally entirely between the center and right metal lines.

In the present invention, the left region can be read to be the first region of claim 26. The left or first region has the same dielectric material as the material that lies between the left and center metal lines of metal-1 layer 316. Thus, applicant's specification supports a first dielectric material that lies in a first region, where the first region lies horizontally entirely between the center and right metal lines.

It is important to note that the claims do not recite that the first dielectric material lies horizontally entirely between the metal lines, but instead requires that a first region lie horizontally entirely between the metal lines. In addition, applicant further claims that the first region includes the first dielectric. The first dielectric material is not limited to the region, but is included in the region. Thus, applicant's specification supports a region that lies horizontally entirely between the second and third metal lines that includes the first dielectric material.

In addition, the second dielectric material of claim 26 can be read to be, for example, dielectric material 346. As additionally shown in FIGs. 5B and 12B, dielectric material 346 lies in the adjoining right region between the center and right metal lines of metal-1 layer 316, and also extends upward above the first or left region. Thus, dielectric material 346 lies over the first region. Dielectric material 346 does not lie vertically over the first region, but claim 26 does not require this limitation.

Applicant's FIG. 9B also supports these limitations. As shown in FIG. 9B, the first plurality of metal lines of claim 26, including the first, second, and third metal lines, can be read to be, for example, the left metal line, the center metal line, and the right metal line of metal-1 layer 716. In addition, the first dielectric material of claim 26 can be read to be, for example, dielectric material 718.

With respect to the first region of claim 26, a volume that exists horizontally entirely between the center and right metal lines of metal-1 layer 716 can be read to be, for example, the first region. The first region, in turn, includes dielectric material 718 which is the same dielectric material that exists between, and lies over, the left and center metal lines of metal-1 layer 716. Thus, applicant's specification supports a first dielectric material that lies in a first region, where the first region lies horizontally entirely between the center and right metal lines.

In addition, the second dielectric material of claim 26 can be read to be, for example, dielectric material 730. As additionally shown in FIG. 9B, dielectric material 730 lies vertically over the first region. As a result, applicant's specification supports a second dielectric material that lies over the first region, where the first region lies horizontally entirely between the center and right metal lines. Thus, from what applicant can determine, claim 26 is supported by applicant's specification. As a result, it is believed that claim 26 satisfies the requirements of the first paragraph of section 112.

With respect to claim 34, the Examiner argued that the specification does not disclose a second dielectric material that lies in a second region that lies horizontally entirely between the fourth and fifth metal lines. As noted above, applicant is not claiming that the second dielectric material lies horizontally entirely between the fourth and fifth metal lines, but instead claims that a second region lies horizontally entirely between the fourth and fifth metal lines. In addition, applicant further claims that the second region includes the second dielectric.

As shown in applicant's FIGs. 5B and 12B, the fourth and fifth metal lines can be read to be, for example, the left and right metal lines of metal-2 layer 324. In addition, a second region, which lies horizontally entirely between the left and right metal lines of metal-2 layer 324, includes dielectric 346 which, as noted above, can be read to be the second dielectric material. Thus, from what applicant can determine, claim 34 is supported by applicant's specification. As a result, it is believed that claim 34 satisfies the requirements of the first paragraph of section 112.

With respect to claim 36, the Examiner argued that the specification does not disclose that the second dielectric material is formed on and over the second region. As noted above, a second region can lie horizontally entirely between the left and right metal lines of metal-2 layer 324. As shown in applicant's FIG. 5B, dielectric

material 346 is formed on and above the second region, where the second region lies horizontally entirely between the fourth and fifth metal lines. Thus, from what applicant can determine, claim 36 is supported by applicant's specification. As a result, it is believed that claim 36 satisfies the requirements of the first paragraph of section 112.

With respect to claim 45, the Examiner argued that the specification does not disclose a second plurality of metal lines having second and third surfaces, and including fourth, fifth, and sixth metal lines. The Examiner also argued that the specification does not disclose a second dielectric material and a third dielectric material.

With respect to applicant's FIG. 5B, the first plurality of metal lines of claim 45, including the first, second, and third metal lines, can be read to be, for example, the left, center, and right metal lines of metal-4 layer 344. The second plurality of metal lines of claim 45, including the fourth, fifth, and sixth metal lines, can be read to be, for example, the left, center, and right metal lines of metal-3 layer 334.

The first dielectric material can be read to be, for example, dielectric layer 340. The second dielectric material can be read to be, for example, the air dielectric that lies between the first and second (left and center) metal lines of metal-4 layer 344 and the fourth and fifth (left and center) metal lines of metal-3 layer 334.

The third dielectric material can be read to be, for example, dielectric material 346 that lies between the second and third (center and right) metal lines of metal-4 layer 344 and the fifth and sixth (center and right) metal lines of metal-3 layer 334. Thus, from what applicant can determine, claim 45 is supported by applicant's specification. As a result, it is believed that claim 45 satisfies the requirements of the first paragraph of section 112.

With respect to claim 46, the Examiner argued that the specification does not disclose a fourth dielectric material. The fourth dielectric material of claim 46 can be

read to be, for example, dielectric material 330 as shown in applicant's FIG. 5B. Thus, from what applicant can determine, claim 46 is supported by applicant's specification. As a result, it is believed that claim 46 satisfies the requirements of the first paragraph of section 112.

With respect to claim 49, the Examiner argued that the specification does not disclose that the third dielectric material extends from a point between the fifth and sixth metal lines to a point between the seventh and eighth metal lines. The seventh and eighth metal lines can be read to be, for example, the left and right metal lines of metal-2 layer 324 as shown in applicant's FIG. 5B.

In addition, the third dielectric material can be read to be, for example, material 346 which, as shown in FIG. 5B, extends down between the seventh and eight metal lines (left and right) of metal-2 layer 324. Thus, from what applicant can determine, claim 49 is supported by applicant's specification. As a result, it is believed that claim 49 satisfies the requirements of the first paragraph of section 112.

With respect to claim 50, as shown in applicant's FIGs. 5B and 6B, the first plurality of metal lines of claim 50, including the first, second, and third metal lines, can be read to be, for example, the left, center, and right metal lines of metal-1 layer 316. The second plurality of metal lines of claim 50, including the fourth and fifth metal lines, can be read to be the left and right metal lines of metal-2 layer 324. The third plurality of metal lines of claim 50, including the sixth, seventh, and eighth metal lines, can be read to be, for example, the left, center, and right metal lines of metal-3 layer 334.

The first dielectric material of claim 50 can be read to be, for example, dielectric layer 320. The second dielectric material of claim 50 can be read to be, for example, dielectric layer 330. Claim 50 has been amended to correct typographical errors regarding the surfaces that the second dielectric material contacts. The third

dielectric material of claim 50 can be read to be, for example, the dielectric that lies between the left and center metal lines of metal-1 layer 316.

The fourth dielectric material of claim 50 can be read to be, for example, dielectric material 346 in FIG. 5B and 354 in FIG. 6B, while the fifth dielectric material of claim 50 can be read to be, for example, the air dielectric that lies between the left and center metal lines of the metal-3 layer 334. Thus, from what applicant can determine, claim 50 is supported by applicant's specification. As a result, it is believed that claim 50 satisfies the requirements of the first paragraph of section 112.

With respect to claim 51, as shown in applicant's FIG. 6B, the sixth dielectric region can be read to be, for example, the air dielectric that lies between the center and right metal lines of metal-3 layer 334. Thus, from what applicant can determine, claim 51 is supported by applicant's specification. As a result, it is believed that claim 51 satisfies the requirements of the first paragraph of section 112.

With respect to claim 52, as described above, applicant has shown that the fifth and sixth dielectrics can be read to be air dielectrics which, as required by claim 52, are equivalent. Thus, from what applicant can determine, claim 52 is supported by applicant's specification. As a result, it is believed that claim 52 satisfies the requirements of the first paragraph of section 112.

With respect to claim 54, as shown in FIGs. 5B and 6B, a dielectric material lies between the left and center metal lines of metal-1 layer 316, and between the center and right metal lines of metal-1 layer 316 where the dielectric material contacts the side wall of the center metal line. Thus, from what applicant can determine, claim 54 is supported by applicant's specification. As a result, it is believed that claim 54 satisfies the requirements of the first paragraph of section 112.

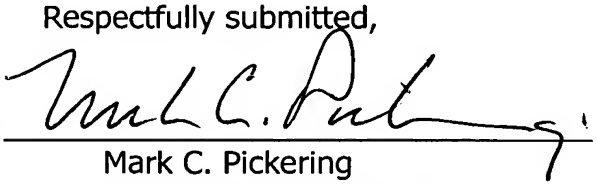
Thus, from what applicant can determine, claims 26, 33-36, and 45-55 satisfy the requirements of the first paragraph of section 112.

The Examiner also rejected claim 6 under 35 U.S.C. §103(a) as being unpatentable over Koo (U.S. Patent No. 6,262,446). The Examiner originally made this rejection in the office action mailed January 30, 2003. In the amendment filed on April 16, 2003, applicant responded to the Koo rejection of claim 6 (beginning at the bottom of page 14).

In the present office action, the Examiner repeated the rejection of claim 6 as being unpatentable over Koo. Applicant, however, has been unable to find any comments from the Examiner responding to applicant's argument, and assumes that the Examiner inadvertently omitted the comments. Applicant notes that applicant can not further respond to the Examiner without knowing why the Examiner believes the remarks presented by applicant are insufficient to place claim 6 in a condition for allowance. (See MPEP §707.07(f).)

Thus, for the foregoing reasons, it is submitted that all of the claims are in a condition for allowance. Therefore, the Examiner's early re-examination and reconsideration are requested.

Respectfully submitted,

Dated: 12-30-03 By: 

Mark C. Pickering
Registration No. 36,239
Attorney for Assignee

P.O. Box 300
Petaluma, CA 94953-0300
Direct Dial Telephone No. (707) 762-5583
Telephone: (707) 762-5500
Facsimile: (707) 762-5504
Customer No: 33402

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Patent Appln. No. 10/010,696 File No. 100-16200 By: MCP

In the Matter of the Application of: Visvamohan Yegnashankaran et al.

Title: Multilevel Metal Interconnect and Method . . .

Date Mailed: 07-30-02 Due Date:

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